

REMARKS

Favorable reconsideration of this application is respectfully requested in view of the following remarks.

Submitted with this Amendment is a substitute Declaration which corrects an inadvertent typographical error with respect to the filing date of the corresponding international application.

The objection to the use of the term "elongate" in Claim 1 is noted. Actually, the term "elongate," at least in mechanical-type patent applications such as this, is quite common. It may be that the Examiner here is not so familiar with the use of that term and so Claim 1 is amended to adopt the helpful suggestion made by the Examiner, as it does not change the claim scope. Accordingly, withdrawal of the claim objection is respectfully requested.

Before referring to the claims in particular and prior to addressing the other issues raised in the Official Action, a brief overview of the apparatus at issue here is provided. The subject matter at issue in this application pertains to an apparatus for tempering a bent glass sheet. The bent glass sheet tempering apparatus includes a mechanism 19 such as a conveyor for advancing the bent glass sheet and a pair of blastheads 20, 21 which deliver jets of quench gas to quench the bent glass. The blastheads 20, 21 are arranged in opposing relation above and below the path of the bent glass sheet. Each blasthead includes a plurality of spaced elongate plenums 22 that supply the quench gas to an array of quench nozzles 23 from which the jets of quench gas are delivered. The quench nozzles 23 possess a length exceeding their diameter, and the quench nozzles 23 of each plenum are mutually inclined to produce diverging jets of quench gas. As seen in, for example, Fig. 2a, the plenums

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22 extend transverse to the direction of conveyance of the bent glass sheet. In addition, the array of quench nozzles is curved in at least one direction.

The bent glass sheet tempering apparatus here is advantageous in a number of respects, at least some of which are discussed in the present application such as in the discussion beginning in the last paragraph of page three of the application.

The bottom half of page four and the top half of page five of the Official Action set forth various claim rejections based on the second paragraph of 35 U.S.C. § 112. Several of the claims are amended to address the concerns raised in the Official Action.

With specific regard to the Claim 8 language referring to the inclination of the connecting surfaces, the claim language is correct. It may be that the directions of incline and divergence depend on the direction of view, but there is nothing inaccurate or incorrect about the current language. The connecting surfaces 26 of the lower blasthead 21 illustrated in Fig. 4 of the present application are described beginning near the bottom of page ten of the present application. The connecting surfaces 26 can be thought of as forming the upper two faces of a triangular prism lying on its side, but interrupted at spaced apart intervals by the plenums 22. The connecting surfaces of the upper blasthead are an inversion of the connecting surfaces of the lower blasthead.

If the viewpoint is outward from the center line such that one is situated on the center line looking toward either side, the connecting surfaces of the lower blasthead are inclined downward away from the center line. Viewed from this same perspective, the upper connecting surfaces are angled upwards as one looks to the sides. On the other hand, if one is positioned at the side looking toward the center

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line, the upper connecting surfaces would be inclined downwards toward the center line. Thus, the upper and lower connecting surfaces are closest together at the center line, and farther apart at the sides of the quench station, thus making it appropriate it to describe them as diverging in a direction from the center line outwards towards the sides. It is respectfully submitted that the language in Claim 8 is accurate and consistent with the described and illustrated apparatus. To the extent the Examiner may still be concerned about the claim language, the Examiner is kindly asked to contact the undersigned.

The top of page five of the Official Action raises a concern about the language in Claim 5. The concern here is not readily apparent as Claim 5 does not recite that the profile is fixed and the local curvature of the glass is changeable at any fixed point as it is conveyed. To the extent the Examiner still has a concern on this point, he is kindly asked to clarify the concern.

Withdrawal of the claim rejection under 35 U.S.C. § 112, second paragraph is respectfully requested.

The only independent claim at issue here is Claim 1 which defines an apparatus for tempering a bent glass sheet. As claimed, the bent glass sheet tempering apparatus comprises means for conveying the bent glass sheet along a predetermined path through the apparatus, and a pair of blastheads for quenching the bent glass sheet with jets of quench gas. The blastheads include upper and lower blastheads positioned in opposed relationship above and below the predetermined path along which the bent glass sheet is conveyed. In addition, each blasthead comprises a plurality of spaced elongate plenums for supplying quench gas to an array of quench nozzles from which the jets of quench gas issue. The

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quench nozzles are configured so that their length exceeds their diameter, and the quench nozzles of each plenum are mutually inclined to provide diverging jets of quench gas. The plenums extend transverse to the direction of conveyance of the bent glass sheet and each array of quench nozzles is curved in at least one direction.

The Official Action sets forth a rejection of Claims 1-5 and 7-9 based on the disclosure in U.S. Patent No. 4,515,622 to McMaster et al. Claims 6 and 10-12 are not identified as being included in this rejection, though Claims 6 and 10-12 are discussed later in the Official Action, on pages seven and eight. Clarification on this point would be appreciated. The Examiner is also asked to provide clarification about the status of Claims 13-18 – Form PTOL-326 only refers to Claims 1-12 and does not acknowledge the presence of Claims 13-18, let alone the status of such claims.

Claims 1-12 and 19 are readable on the elected invention.

The prior art rejection based on the disclosure in McMaster et al. is respectfully traversed. As a general matter, the comments in the Official Action pertaining to McMaster et al. seem to vacillate back and forth between different drawing figures in McMaster et al., without any recognition that McMaster et al. describes two significantly different embodiments of a glass sheet quench. A first embodiment of the glass sheet quench disclosed in McMaster et al. is shown in Figs. 1-4 and 7 and is specifically constructed to quench flat glass sheets, while the second disclosed embodiment of the glass sheet quench shown in Figs. 5, 6 and 8 is specifically configured to quench bent glass sheets.

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It is apparent from the wording in independent Claim 1, as well as the discussion at various places in the application (e.g., the paragraph beginning at line 24 of page three and the second full paragraph of page eight) that the claimed tempering apparatus here is a bent glass sheet tempering apparatus, not a flat glass sheet tempering apparatus.

One reason the distinction between a tempering apparatus for flat glass and a tempering apparatus for bent glass is particularly relevant here is that the second embodiment of the arrangement shown in Figs. 5, 6 and 8 of McMaster et al. -- the bent glass version of the glass sheet quench -- is not actually practical to operate. As mentioned near the bottom of page two of the present application, it is not uncommon for at least a small proportion of glass sheets to break during toughening. This can be due to the relative high thermal stresses that are produced. In any event, the broken glass that results is referred to as cullet and must be removed on a regular basis in order for production to successfully continue. Thus, areas of the lower blasthead where cullets collect must be relatively accessible so that the cullet can be raked out.

If the plenums extend parallel to the direction of conveyance of the bent glass sheets, they effectively partition the space between adjacent pairs of plenums into a series of long troughs extending through the quench station in the direction of conveyance. It is not possible to access these troughs from the side of the quench station because the first plenum (i.e., the plenum closest to the side of the quench station) obstructs access to the first trough, and so on. Access to the center of the quench station is particularly difficult. Indeed, an individual is only able to clear cullet from such a quench station by climbing into the production line, either into the

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bending station (62 in Fig. 5 of McMaster et al.) or the conveyor downstream of the quench station 14'. This necessitates a complete shutdown of the apparatus, and appropriate isolation and locking-off measures for safety.

The toughening of quite thin glass is much more prevalent now than it was in the early 1980's at the time McMaster et al. was filed. Thus, in its time, McMaster et al.'s bent glass quench may have had useful application because the toughening of very thin glass was not so common. Thus, cullet did not result on a regular basis and so the shortcomings discussed above were not encountered regularly.

On the other hand, with the plenums extending transverse to the direction of the conveyance as in the apparatus here, the troughs are also arranged transverse and so their open ends are relatively easily accessible from the sides of the line. Independent Claim 1 recites the plenums extending transverse to the direction of conveyance. Nevertheless, the Claim 1 wording is changed in minor respect to refer to the side access provided by the transversely extending arrangement of the plenums as discussed in the present application, for example near the bottom portion of page three of the application.

As mentioned above, Figs. 1-4 and 7 of McMaster et al. specifically pertain to a flat glass sheet quench, as is apparent from the discussion in line 39 of column 4 and line 43 of column 7. On the other hand, Figs. 5, 6 and 8 of McMaster et al. specifically pertain to the tempering of bent glass sheets. The Official Action seems to take the position that it would have been obvious to combine these two embodiments. Actually, that is not the case at all.

Beginning with the second embodiment of McMaster et al. specifically pertaining to a bent glass sheet quench, substituting the quench station shown in the

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first embodiment (i.e., Figs. 1 and 2) would not result in the apparatus recited in Claim 1 because the array of quench nozzles in Fig. 2 is not curved. This is readily understandable, given that the first embodiment in McMaster et al. specifically pertains to tempering flat glass.

The plenums illustrated in Figs. 6 and 8 of McMaster et al. are straight. Figs. 6 and 8 seemingly depict a curved array of nozzles only because of the orientation in which the straight plenums are mounted in the frame of the blasthead. This method of producing the illustrated array of nozzles is only possible when the plenums are parallel to the direction of conveyance. Otherwise, the blastheads must be so far apart to allow the shuttle to pass between them that effective quenching is not achievable. In addition, the discussion at the top of column 4 of McMaster et al. states that the quench construction is specifically intended to simplify construction by permitting the use of straight plenums. At other places, McMaster et al. expresses a similar focus on using straight plenums -- see the discussion in lines 48-52 of column 7 and in lines 19-22 of column 8. It is thus apparent that the focus of McMaster et al. is to use the straight plenums which were available, and to keep the overall construction simple. To thus suggest that it would have been obvious to replace the straight plenums specifically intended by McMaster et al. with curved plenums contradicts that which McMaster et al. specifically describes and seeks to achieve.

In addition, there is absolutely no disclosure that would lead one to turn the plenums illustrated in Figs. 6 or 8 through a right-angle so that they extend transverse to the direction of conveyance of the bent glass sheet as claimed here. This too would also be contrary to the disclosure in McMaster et al..

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Paragraph "11" on page six of the Official Action references a discussion in lines 20-26 of column 4 of McMaster et al. The Official Action takes the comments in this portion of the McMaster et al. disclosure out of context. A reading of the entire paragraph beginning at line 9 of column 4 reveals McMaster et al.'s concern about alignment of the impingement of the gas jets. McMaster et al. suggests adjusting the alignment by altering the relative positions of the plenums, a suggestion likely involving translational movement. There is certainly no mention in this paragraph about rotating the plenums as would be required to achieve the arrangement recited in independent Claim 1.

For at least the reasons discussed above, withdrawal of the rejection of independent Claim 1, and the associated dependent claims, based on the McMaster et al. et al. disclosure is respectfully requested.

The dependent claims define further distinguishing features associated with the bent glass tempering apparatus here. For example, Claim 2 defines that the array of quench nozzles comprises rows of quench nozzles extending along lines which are curved in the direction of elongation of the plenums, and Claim 3 recites further details about the curved lines along which the quench nozzles extend. The Official Action states that McMaster et al. clearly discloses, in alternate embodiments, plenums with a curved profile. Actually, as explained above, that is not so. What McMaster actually discloses and seeks to provide are straight plenums, whereby the nozzles form straight rows in the direction of elongation of the plenums.

The comments pertaining to other dependent claims in this application, such as the creatively contrived comments in paragraph 15 of the Official Action, are an

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interesting read. Unfortunately, they do not rise to the level of establishing a *prima facie* case of obviousness. However, as these dependent claims are allowable by virtue of their dependent from allowable independent Claim 1, a detailed discussion of the additional distinguishing aspects set forth in the dependent claims is not set forth at this time.

Early and favorable action concerning this application is respectfully requested.

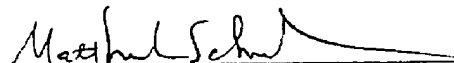
Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: January 28, 2009

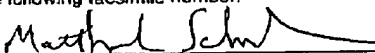
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